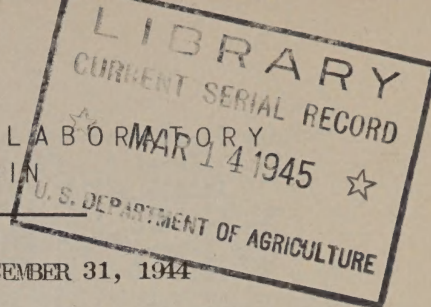


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U. S. FOREST PRODUCTS LABORATORY
MADISON, WISCONSIN



LIST OF PUBLICATIONS JULY 1 TO DECEMBER 31, 1944

Publications available for distribution at the Laboratory are marked with an asterisk (*). Blanket requests for publications will not be filled. Publications not marked with an asterisk are available as noted after the title.

Trade journals and magazines referred to, if not available in your local library, may be obtained from publishers listed on the last page.

CHEMISTRY OF WOOD AND DERIVED PRODUCTS

- *Forest Products Laboratory resin-treated, laminated, compressed wood, compreg, by A. J. Stamm and R. M. Seborg. FPL Mimeo. 1381, revised July 1944.

Revision brings Laboratory's development of compreg up to date, presenting details of gluing and pressing operations — favorable moisture content, critical temperatures, time of pressing. Also presents results of test data, discusses methods of molding precarved compreg blanks, and tells about wartime uses of product.

- *Heat-stabilized compressed wood (staypak), by R. M. Seborg, M. A. Millett, A. J. Stamm. FPL Mimeo. 1580, revised Dec. 1944.

Describes method for making a tough compressed wood that contains no stabilizing resin within the cell wall structure, but still does not recover from compression under swelling conditions, due to the relief of internal stresses caused by a limited flow of the lignin cementing material under the pressing conditions.

The following 8 papers were presented at the Sept. 1944 meeting of the American Chemical Society:

- *Analysis of wood sugars, by J. F. Saeman, E. E. Harris, and A. A. Kline. FPL Mimeo. R1459.

Describes the analytical methods used for the determination of amount of sugar, and of fermentable sugar in solutions obtained by the hydrolysis of wood.

- *Fermentation of wood sugars to ethyl alcohol, by R. H. Leonard and G. J. Hajny. FPL Mimeo. R1466.

Describes some of the problems involved in the fermentation of sugar solutions obtained in the hydrolysis of wood.

*Fodder yeast from wood sugar, by W. H. Peterson, J. F. Snell, and W. C. Frazier. FPL Mimeo. R1467.

Torula utilis and other yeasts grow on wood sugar. Yields, as dry yeast, of 35 to 40 percent of the total sugar were obtained. About 90 percent of the total reducing sugar was used. Sugars from both hardwoods and softwoods may be used.

*Hydrolysis of wood in a stationary digester by successive treatments with dilute sulfuric acid, by E. E. Harris, Edward Beglinger, G. J. Hajny, and E. C. Sherrard. FPL Mimeo. R1455.

Wood may be hydrolyzed to sugar at elevated temperature and pressure, with yields ranging from 45 to 57 percent of the weight of wood substance. Fermented sugars produced 40 to 60 gallons of 95 percent alcohol per ton of softwood, 33 to 42 gallons per ton of hardwood.

*Kinetics of the hydrolysis of wood and of decomposition of sugars in dilute acid at high temperatures, by J. F. Saeman. FPL Mimeo. R1457.

Saccharification of wood cellulose involves two reactions; hydrolysis to reducing sugars and decomposition of sugars formed. Rates of both of these reactions were determined and shown to be first order and related to the concentration of the acid and the temperature.

*Quantitative saccharification of wood and cellulose, by J. F. Saeman, J. L. Bubl, and E. E. Harris. FPL Mimeo. R1458.

Cellulosic materials may be converted to reducing sugars in nearly quantitative yields by treatment with 72 percent sulfuric acid for 45 minutes at 30° C. followed by a secondary hydrolysis for 1 hour at 15 pounds steam pressure.

*Review of wood saccharification processes in the United States prior to World War II, by E. C. Sherrard and F. W. Kressman. FPL Mimeo. R1454.

Reviews production of alcohol from wood and pulp liquors. From 1910 to 1923 sugars yielding 25 gallons of alcohol per ton of wood in 15 minutes hydrolysis time were produced at Georgetown, S. C., and Fullerton, Ia. From 1913 to 1939 sulfite liquor was fermented to produce alcohol at Mechanicsville, N. Y.

*Rotary digester in wood saccharification, by R. H. Plow, J. F. Saeman, H. D. Turner, and E. C. Sherrard. FPL Mimeo. R1456.

Conditions for both single stage and multistage hydrolysis were studied. Single stage hydrolysis resulted in yields of 30 gallons per ton of wood in 4 to 10 minutes. Limited multistage hydrolysis gave 75 percent of the yields given in full multistage.

CONTAINERS

*Tests for shipping containers in revolving hexagonal drum box-testing machines. FPL Mimeo. R1462, Oct. 1944.

Reviews the use of the 7-foot and 14-foot diameter revolving drums for determining the ability of a container to protect its contents, and to withstand rough handling. A basis for selecting either the small or the large drum for a particular test is discussed. Detailed drawings of the hazards in the drums are included.

*Tests of solid fiberboard boxes made of wet-strengthened reclaimed material, by K. E. Skidmore and E. C. Myerá. FPL Mimeo. R1470, Jan. 1945.

Presents the results of tests on solid fiberboard boxes made of a wet-strengthened container board. Boxes made of this fiberboard, which consists of 20 percent all kraft waste paper and 80 percent old containers, compare favorably in rough handling and compression tests with boxes made of V2s grade fiberboard.

GLUE AND PLYWOOD

*Analysis for filler content of urea-formaldehyde glues, by A. E. Gabriel and L. E. Cohodas. FPL Mimeo. 1333, Sept. 1944.

Describes 6 methods for the determination of filler; also gives directions for the determination of nonvolatile content of the glues.

*Bleed-through of glue in aircraft plywood, by R. J. Preston and F. H. Kaufert. FPL Mimeo. 1541, Nov. 1944.

Presents results of studies on (1) the factors contributing to the development of bleed-through; (2) the secondary gluing of plywood showing various amounts of bleed-through; and (3) the quality of preliminary glue boards in plywood showing various amounts of bleed-through.

*Gluing with low-temperature-setting phenol, resorcinol, and melamine glues — development of joint strength in birch plywood cured at several temperatures for various periods of time, by H. D. Bruce, W. Z. Olson, J. M. Black, and A. H. Rauch, FPL Mimeo. 1531, Dec. 1944.

Joints increased in strength with increased temperature and time of heating until the glue became sufficiently cured to develop the full strength of the wood. Differences between glues in rate of development of joint strength were taken as indicative of diverse curing characteristics.

Laminating lumber for extreme service conditions, by C. D. Dosker and A. C. Knauss. Mech. Engrs., 66(12):763-773, Dec. 1944.

Discusses method of laminating timbers for ship construc-

tion and outdoor service by gluing with low-temperature-setting phenol, melamine, and resorcinol resins; results of tests for strength and resistance to delamination of glue joints in white oak and Douglas-fir subjected to salt-water soaking and unprotected outdoor exposure.

*Summary of methods of bag-molding plywood, by B. G. Heebink. FPL Mimeo. 1347, revised Sept. 1944.

A brief discussion of equipment and limitations of current methods of bag-molding.

MECHANICAL PROPERTIES

Supplements to FPL Mimeo. 1318, Design of plywood webs in box beams:

*Additional tests of box beams and I-beams to substantiate further the design curves for plywood webs in box beams — tests of plywood webs in the tension field, by W. C. Lewis, T. B. Heebink, W. S. Cottingham, and E. R. Dawley. FPL Mimeo. 1318-C, Aug. 1944.

*Buckling and ultimate strengths of shear webs of box beams having plywood face grain direction parallel or perpendicular to the axis of the beam, by W. C. Lewis, T. B. Heebink, and W. S. Cottingham. FPL Mimeo. 1318-D, Oct. 1944.

Tests of a limited number of box beams with vertical or horizontal face grain in the plywood webs indicate that in general, the webs buckle at shear stresses substantiating the experimental buckling curve presented in Figure 17, FPL Report 1318-B, subsequently published as part of Figure 2-41, ANC Bulletin 18, "Design of Wood Aircraft Structures."

*The effect of repeated buckling on the ultimate strengths of box beams with shear webs in the inelastic buckle range, by W. C. Lewis, T. B. Heebink, and W. S. Cottingham. FPL Mimeo. 1318-E, Dec. 1944.

Presents results of exploratory tests on box beams with 45° grain shear webs and with a/a_0 values less than 1.6, loaded repeatedly to about two-thirds of the design ultimates for the webs as established by the curves of FPL Report 1318.

*Effects of certain defects and stress-concentrating factors on the strength of tension flanges of box beams, by W. C. Lewis, T. B. Heebink, and W. S. Cottingham. FPL Mimeo. 1513, Nov. 1944.

Presents results of tests arranged to allow a study of effects of bolt holes, various shapes of load blocks, sloping grain, pre-existing compression failures, and of compression failures induced by inverted loading on the tension flanges of box or similar beams of wood and plywood.

*Effect of length on the buckling stresses of thin-walled, plywood cylinders in axial compression, by E. W. Kuenzi. FPL Mimeo. 1514, Oct. 1944.

Presents an empirical design curve for plywood cylinders of lengths shorter than the diameters, to be used in conjunction with the design curves of report No. 1322.

*Strength of glued laminated Sitka spruce made up of rotary-cut veneers, by R. F. Luxford. FPL Mimeo. 1512, Sept. 1944.

Presents results of study to determine the effects of cross grain, scarf joints and orientation of laminations on the strength of stock made from rotary-cut veneers.

*Survey of strength and related properties of yellow-poplar, By R. F. Luxford and L. W. Wood. FPL Mimeo. 1516, Dec. 1944.

Reviews the strength and related properties of yellow-poplar particularly as affected by color and stain, and compares yellow-poplar recently produced for use in airplane construction with that previously tested and with spruce.

PATHOLOGY

*Breaking radius of discolored wood in aircraft veneers, by T. C. Scheffer and C. G. Duncan. Forest Path. Spec. Release No. 22, Nov. 1944.

The breaking radii of variously discolored veneers of 6 different hardwood species were small enough, for most of the discolorations, to indicate that such veneers can be used successfully on members having curved surfaces.

*Color tests for differentiating heartwood and sapwood of certain oaks and pines. FPL Tech. Note 253, January 1945.

Contents indicated by title.

PULP AND PAPER

*Properties of laminated plastics made from lignin and lignin-phenolic resin-impregnated papers, by R. J. Seidl, H. K. Burr, C. N. Ferguson, and G. E. Mackin. FPL Mimeo. 1595, Aug. 1944.

Presents results of preliminary survey to determine approximately the effects of certain major variables on the properties of the plastics and papers.

*Utilization of less commonly used species and waste and the improvement of yield in pulp manufacture, by M. W. Bray, E. R. Schafer, and J. N. McGovern. Amer. Pulp & Paper Mill Supts. Assn. Yearbook & Program 25:104, 106-107, 110, 112, 114, 116, 1944. Same: FPL Mimeo. R1451.

With decreasing pulpwood production and inventories, methods of improving the yield of pulp and the use of so-called less desirable (but readily available) species and wood waste

warrant serious consideration. Discusses modifications of pulping procedure and applicability of various materials to the kraft, sulfite, and ground wood processes.

- *Wet-strengthened fiberboard from reclaimed fiber, by F. A. Simmonds, Axel Hyttinen, and C. O. Seborg. FPL Mimeo. R1469, Dec. 1944.

In the manufacture of V-type shipping containers, the quality of paperboard made entirely of reclaimed fiber is definitely improved with the proper combination of wet-strengthening resin, sizing agent, and laminating adhesive. The improvements are obtained in dry board as well as wet, although the greater improvement is in the wet condition.

SEASONING

- *Air-seasoning aircraft stock. FPL Mimeo. 1366, revised Oct. 1944. Presents a number of important changes in the rules for air seasoning lumber to prevent degrade.

WOOD PRESERVATION

- *Effect of moisture changes on the shrinking, swelling, specific gravity, air or void space, weight, and similar properties of wood, by J. D. MacLean. FPL Mimeo. R1448, Sept. 1944.

Discusses moisture content, fiber saturation point, moisture equilibrium, weight of wood substance and water per unit volume; volume occupied by wood substance, water and air space; and factors affecting shrinkage, swelling, and specific gravity. Formulas and charts show methods for computing shrinkage, swelling, specific gravity, and other variables.

- *Ignition and charring temperatures of wood, by G. C. McNaughton. FPL Mimeo. R1464, Nov. 1944.

Shows that time has an important relation to the effect of heat upon wood, and that chemical destruction of wood is not associated with any critical temperature.

- International termite exposure test: 15th progress report, by G.M. Hunt and T. E. Snyder. AWPA Proc. 1944.

Reports the condition of test specimens treated with different preservatives and exposed for periods of time up to 15 years to termites and decay in the Panama Canal Zone, Australia, Honolulu, and South Africa.

- *Study of methods of measuring the water repellency of water repellents and water-repellent preservatives for wood, by F. L. Browne and A. C. Schwebbs. FPL Mimeo. R1453, Oct. 1944.

A detailed study of 6 different methods of determining water repellency and of modifications of some of the methods leading to recommendations on the subject. Of interest to

those concerned with the technical problems of evaluating water repellency and of writing specifications for water repellents and water repellent preservatives.

WOOD STRUCTURE

*Longitudinal shrinkage of balsa, by B. H. Paul and J. P. Limbach. FPL Mimeo. 1364, Dec. 1944.

Total longitudinal shrinkage of balsa ranged from 0.105 to 0.630 percent. Specimens heavier than 0.10 in specific gravity on an oven-dry weight and volume basis did not exceed 0.300 percent in shrinkage. Data indicate that balsa below specific gravity of 0.10 should be excluded from aircraft.

Southern hard elms as substitutes for rock elm, by M. E.

Baudendistel and B. H. Paul. South. Lbrman., 169(2129): 211-215, Dec. 15, 1944.

Specific gravity values of cedar elm and winged elm equal similar values for northern-grown rock elm. Shrinkage of these species was close to that of rock elm.

WOOD UTILIZATION, LOGGING, AND MILLING

Place of machining properties in wood utilization, by E. M. Davis.

South. Lbrman., 169(2129):155-156, Dec. 15, 1944.

Wood Products, 49(12):30, 32, 34, Dec. 1944.

Discusses newness and importance of machining research. Stresses growing importance in view of (1) higher finishing standards, (2) increased use of processed wood (uralloy, compreg, fireproofed, etc.), and (3) increased prospective use of tropical woods. Touches on increasing obsolescence and improved newly developed woodworking machines.

Small forest industry, by C. V. Sweet. Jour. Forestry, 42(7):

509-512, July 1944.

Discusses possibilities of an intermediate group of forest industries to complete the chain of utilization and fabrication. Stresses need for research in this special field as opposed to relying on the chance applications that result from research primarily geared to the large industry field.

Small sawmill improvement series:

*Small mill conveyor, by C. J. Telford. FPL Mimeo. R899-21, Sept. 1944.

Working drawings of a single conveyor system to take sawdust, slabs, edgings, and boards from the mill to disposal points.

*Burning waste material, by C. J. Telford. FPL Mimeo. R899-22, Nov. 1944.

Working drawings of various types of burners for disposal of waste incident to the sawing of lumber at portable mills.

Use and adaptation of power saws for pulpwood harvesting, by J. Harry Rich. South. Lbrman., 169(2129):175-179, Dec. 15, 1944.

Reviews various types of power sawing equipment that reduce the labor in producing pulpwood. Features the need of careful selection of new methods to suit the particular operating conditions at hand and especially the need of better training and supervision of wood workers.

*Wartime status of sawdust, shavings, and other wood waste as commercial raw materials, by G. C. Morbeck. FPL Mimeo. R1450, Aug. 1944.

A brief digest of processes and outlets that permit the use of wood waste as a raw material. Primarily intended to answer inquiries resulting from the impression that wood waste is not an item of considerable value.

MISCELLANEOUS

✓*Gasogens, by R. H. P. Miller. FPL Mimeo. R1463, Nov. 1944.
A general description of the equipment and installation required for the use of charcoal gas and wood gas in lieu of gasoline as fuel for truck motors and summary of comparative road tests made in the Madison area.

*Wood in the national economy, by C. P. Winslow. FPL Mimeo. R1465, Nov. 1944.

Discusses the important part that wood plays, in war and in peace, in the Nation's economy. Outlines future trends of wood utilization, emphasizing the fact that forest industry and forest ownership can look forward to a continued place of major service in the Nation's economic life.

*Wood in war and peace, by G. A. Garratt. Jour. Forestry, 42(9): 636-644, Sept. 1944; Wood Construction, 30(24):6, 26-27, Dec. 1944; FPL Mimeo. R1460.

Outlines the striking advances made in wood technology and wood utilization since World War I, and discusses the adaptation to peacetime service of materials and processes that were developed for war.

PUBLISHERS OF TRADE JOURNALS AND MAGAZINES INCLUDED IN REFERENCES

American Pulp & Paper Mill Superintendents Assn., Miamisburg, O.
AWPA (American Wood Preservers' Assn.), 1427 Eye St., NW.,
Washington 5, D. C.
Journal of Forestry, Mills Bldg., Washington, D. C.
Mechanical Engineering, 29 W. 39th St., New York City.
Southern Lumberman, 917 Berryhill St., Nashville 3, Tenn.
Wood Construction, Green & Market Sts., Xenia, Ohio.
Wood Products, 431 S. Dearborn St., Chicago, Ill.